IMPROVING INFORMATION SYSTEM SECURITY BY EVALUATING HUMAN FACTORS

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A project report submitted in partial fulfillment of the
requirements for the award of the degree of
Master Computer Science

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August 2013

I dedicated this thesis to my beloved mother, and father for their endless supports and encouragements.

ACKNOWLEDGEMENT

IN THE NAME OF GOD, MOST GRACIOUS, MOST COMPASSIONATE

I would like to acknowledge my supervisor, **Dr. NORAFIDA ITHNIN**, for her support, encouragement, guidance, astute and expert editing. I would like to express gratitude for his patience, generosity, and collaboration.

My lovely family; thank you for your perpetual encouragement and support. Your unwavering love that have shaped my mind and opened the doors of opportunity leading me to become the person I am today.

I would like to thank all of the individuals who have helped me during my thesis study.

ABSTRACT

Health Information System (HIS) has been implemented in Malaysia since late 1990s. HIS is an integration of several hospitals' information system to manage administration works, patients and clinical records. Accessing HIS data through the internet make it more vulnerable to data lost, misuses and attacks. Health data is extremely sensitive, therefore they require high protection and information security must be carefully watched as it plays an important role to protect the data from being stolen or harmed. Despite the vast research in information security, the human factor has been neglected from the research community, with most security research giving focus on the technological component of an information technology system. The human factor is still subject to attacks and thus, in need of auditing and addressing any existing vulnerabilities. This research evaluates the human factor by the creation of a survey which examines three distinct user properties. Each of these properties comprises a series of questions, which with their turn assist on confirmation or refutation of three hypotheses. The survey was conducted on five public and private hospitals in Malaysia and distributed to all members of staff who have access on electronic information. Results have shown that the human factor has a significant role in information security; among the surveyed factors (organizational factor, motivational factor and learning), it is confirmed that Learning has the most effect on information system security. This research has addressed two sub factors of learning that are organizational learning and individual learning. In order to improve the information system security in hospitals, it is recommended for future study to consider some other factors except these two sub factors in learning.

ABSTRAK

Sistem Maklumat Kesihatan (HIS) telah dilaksanakan di Malaysia sejak 1990-an. HIS adalah integrasi sistem maklumat beberapa hospital untuk pengurusan kerja-kerja pentadbiran, pesakit dan rekod klinikal. Pengaksesan data HIS melalui Internet menjadikan ia lebih terdedah kepada risiko kehilangan data, penyalahgunaan dan serangan. Data kesihatan adalah sangat sensitif, oleh itu mereka memerlukan perlindungan yang tinggi dan keselamatan maklumat yang perlu pengawasan yang tinggi kerana ia memainkan peranan yang penting untuk melindungi data daripada dicuri atau dirosakkan. Walaupun penyelidikan yang luas dalam Keselamatan Maklumat, faktor manusia telah diabaikan daripada komuniti penyelidikan, dengan kebanyakan penyelidikan keselamatan memberi tumpuan kepada komponen teknologi sistem Teknologi Maklumat. Faktor manusia adalah masih tertakluk kepada serangan dan dengan itu, memerlukan pengauditan dan menangani sebarang kelemahan yang sedia ada. Kajian ini menilai faktor manusia dengan mewujudkan satu kajian yang mengkaji tiga sifat pengguna yang berbeza. Setiap satu daripada sifat-sifat ini terdiri daripada beberapa soalan, yang dengan giliran mereka membantu dalam pengesahan atau penyangkalan tiga hipotesis. Kaji selidik itu dijalankan di lima hospital awam dan swasta di Malaysia dan diedarkan kepada semua kakitangan yang mempunyai akses kepada maklumat elektronik. Keputusan telah menunjukkan bahawa faktor manusia mempunyai peranan penting dalam Keselamatan Maklumat; antara faktor yang dikaji (Faktor Organisasi, Faktor Motivasi dan Pembelajaran), ia mengesahkan bahawa Pembelajaran mempunyai kesan yang paling atas Sistem Maklumat Keselamatan. Kajian ini telah ditangani dua faktor sub Pengajian yang Pembelajaran Organisasi dan Pembelajaran individu. Dalam usaha untuk meningkatkan Sistem Keselamatan Maklumat di hospital-hospital, ia adalah disyorkan untuk kajian masa depan untuk mempertimbangkan beberapa faktor-faktor lain kecuali kedua-dua faktor sub dalam Pembelajaran.